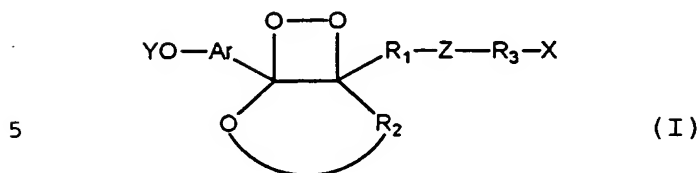


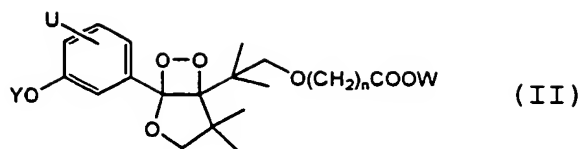
WHAT IS CLAIMED IS:

1. A 1,2-dioxetane derivative of the formula (I):



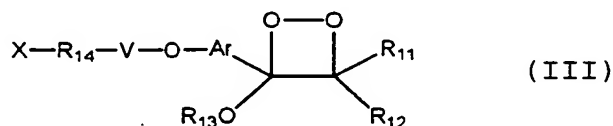
wherein Ar is an aryl group which may have an alkyl group, an aryl group, a halogen atom, an alkoxyl group, a carboxyl group, a formyl group, an alkyl ester, an aryl ester, an alkylketone, an arylketone or a hetero ring bonded thereto, X is a substituent capable of labeling an organic compound or a biological molecule, or an ester, Y is a hydrogen atom, an acyl group or a group of the formula $-\text{Si}(\text{R}_4\text{R}_5\text{R}_6)$ (wherein each of R_4 , R_5 and R_6 which are independent of one another, is an alkyl group or an aryl group), Z is an alkyl group, an aryl group, an oxygen atom, a sulfur atom, a carbonyl group, $-(\text{CO})-\text{O}-$, $-\text{O}-(\text{CO})-$, $-\text{NH}-$, $-\text{NH}-\text{CO}-$, $-\text{CO}-\text{NH}-$, $-\text{OSi}(\text{R}_7\text{R}_8)-$ (wherein each of R_7 and R_8 which are independent of each other, is an alkyl group or aryl group) or a group of the formula $-(\text{R}_9\text{R}_{10})\text{SiO}-$ (wherein each of R_9 and R_{10} which are independent of each other, is an alkyl group or an aryl group), each of R_1 and R_2 is an alkyl group or an aryl group, and R_3 is a spacer.

- 25 2. The 1,2-dioxetane derivative according to Claim 1, which is a 1,2-dioxetane derivative of the formula (II):



wherein Y is the same as Y in the formula (I), n is an integer of from 1 to 20, W is a hydrogen atom, an alkyl group or a succinimido substituent, and U is a hydrogen atom, an alkyl group, an aryl group, a halogen atom, an alkoxy group, a carboxyl group, a formyl group, an alkyl ester, an aryl ester, an alkylketone, an arylketone or a hetero ring.

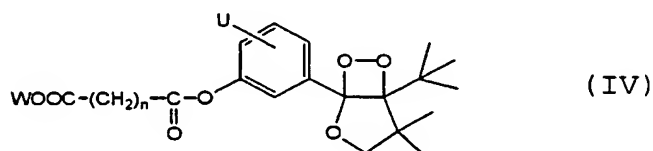
3. A 1,2-dioxetane derivative of the formula (III):



wherein Ar is an aryl group which may have an alkyl group, an aryl group, a halogen atom, an alkoxy group, a carboxyl group, a formyl group, an alkyl ester, an aryl ester, an alkylketone, an arylketone or a hetero ring bonded thereto, X is a substituent capable of labeling an organic compound or a biological molecule, or an ester, V is a carbonyl group or a group of the formula $-\text{Si}(\text{R}_{15}\text{R}_{16})-$ (wherein each of R_{15} and R_{16} which are independent of each other, is an alkyl group or an aryl group), each of R_{11} and R_{12} which are independent of each other, is a hydrogen atom, an alkyl group or an aryl group, or R_{11} and R_{12} may together form a cyclic or polycyclic organic ring group spiro-bonded to the

dioxetane ring, R_{13} is an alkyl group or an aryl group, or R_{13} and R_{11} , or R_{13} and R_{12} , may together form a condensed ring containing the dioxetane ring and a hetero atom, and R_{14} is a spacer.

- 5 4. The 1,2-dioxetane derivative according to Claim 3, which is a 1,2-dioxetane derivative of the formula (IV):



- 10 wherein n is an integer of from 1 to 20, W is a hydrogen atom, an alkyl group or a succinimido substituent, and U is a hydrogen atom, an alkyl group, an aryl group, a halogen atom, an alkoxy group, a carboxyl group, a formyl group, an alkyl ester, an aryl ester, an
15 alkylketone, an arylketone or a hetero ring.

5. A chemiluminescent reagent which contains the 1,2-dioxetane derivative as defined in Claim 1.

6. A chemiluminescent reagent which contains the 1,2-dioxetane derivative as defined in Claim 3.

- 20 7. An immunoassay reagent wherein the 1,2-dioxetane derivative as defined in Claim 1 is bonded to a substance having a specific affinity via a part of its X.

8. An immunoassay reagent wherein the 1,2-dioxetane derivative as defined in Claim 2 is bonded to a substance
25 having a specific affinity via a part of its W.

9. An immunoassay reagent wherein the 1,2-dioxetane derivative as defined in Claim 3 is bonded to a substance

having a specific affinity via a part of its X.

10. An immunoassay reagent wherein the 1,2-dioxetane derivative as defined in Claim 4 is bonded to a substance having a specific affinity via a part of its W.